

LISTING OF THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

Claims What is claimed is:

1. (Currently amended) Device A device for transportation of a flowing medium and/or for heat exchange between a the flowing medium and the device, characterized in that comprising at least one surface of the device is provided with having a plurality of dimples.

2. (Currently amended) Device The device according to claim 1, wherein the plurality of dimples are arranged periodically.

3. (Currently amended) Device The device according to one of the preceding claims claim 1, wherein the plurality of dimples comprises three adjoining dimples each having a center, wherein the centers of three adjoining dimples form forming an equilateral triangle, the distance between the centers of two neighboring adjoining dimples of the equilateral triangle having a first constant value t_2 and the distance between two consecutive rows of the plurality of dimples having a second constant value t_1 .

4. (Currently amended) ~~Device~~ The device according to ~~one of the preceding claims~~ claim 1, wherein the plurality of dimples have a two-dimensional edge.

5. (Currently amended) ~~Device~~ The device according to ~~one of the preceding claims~~ claim 1, wherein the plurality of dimples are rounded at ~~the~~ an edge towards ~~the~~ a remaining surface.

6. (Currently amended) ~~Device~~ The device according to ~~one of the preceding claims~~ claim 1, wherein the plurality of dimples essentially have the form of each comprise a section of a sphere or an ellipsoid.

7. (Currently amended) ~~Device~~ The device according to ~~one of the preceding claims~~ claim 1, further comprising a transport channel, wherein the at least one surface ~~with dimples~~ is provided as ~~the~~ an inner surface of said the transport channel.

8. (Currently amended) ~~Device~~ The device according to claim 7, wherein said the transport channel ~~essentially has the form of~~ comprises a pipe.

9. (Currently amended) Device The device according to ~~one of the preceding claims~~ claim 1, wherein the at least one surface is provided such that, in the proximity to the at least one surface, vortices are formed in a the flowing medium~~[,]~~ when the flowing medium flows along the at least one surface.

10. (Currently amended) Device The device according to ~~one of the preceding claims~~ claim 2, wherein the deposition of particles on ~~said~~ the at least one surface having a periodic dimple structure is reduced in comparison to a flat surface~~[,]~~ when a the flowing medium flows along the at least one surface.

11. (Currently amended) Device The device according to ~~one of the preceding claims~~ claim 2, wherein the formation of ice on ~~said~~ the at least one surface having a periodic dimple structure is reduced in comparison to a flat surface~~[,]~~ when a the flowing medium flows along the at least one surface, and the at least one surface has a lower temperature than the flowing medium.

12. (Currently amended) Surface A surface along which a medium flows, said the medium consisting of a gas, a liquid, a two-phase mixture, or a mixture of multiple phases, ~~characterized in that said surface comprises the surface comprising dimples, wherein the edges of said the~~ dimples are rounded, thereby forming a central dimple area and at least one curvature area for each dimple~~[,]~~ which continuously connects ~~the~~each dimple to the surrounding surface.

13. (Currently amended) Surface The surface according to claim 12, wherein said the central dimple area ~~essentially~~ has the form of a section of a sphere or an ellipsoid.

14. (Currently amended) Surface The surface according to claim ~~12 or 13~~, wherein said the curvature area comprises at least a first curvature area and a second curvature area, the first curvature area having a different curvature than the second curvature area.

15. (Currently amended) Surface The surface according to claim 14, wherein said the first curvature area is rounded

with a first rounding radius and ~~said~~ the second curvature area is rounded with a second rounding radius.

16. (Currently amended) Surface of The surface according to claim 15, wherein the central dimple area essentially has the form of a section of a sphere, and the form forms of the central dimple area[,] of the first curvature area and of the second curvature area in a cross section perpendicular to the surface and through the a center of the dimple, is are defined by the following parameters:

d_1 : Diameter of the central dimple area;

d_2 : Outer diameter of the first curvature area;

t_1 : Outer diameter of the second curvature area;

R_1 , C_1 : Radius and center point of the sphere, the section of which forms the surface of the central dimple area;

R_2 , C_2 : Radius and center point of the rounding radius of the first curvature area;

R_3 , C_3 : Radius and center point of the rounding radius of the second curvature area;

P_1 : Transition point from the central dimple area to the first curvature area;

P_2 : Transition point from the first curvature area to the second curvature area;

P_3 : transition point from the second curvature area to the surrounding surface;

h_1 : Difference in height between the lowest point of the central dimple area and the outer rim of the central dimple area;

h_2 : Difference in height between the inner rim of the first curvature area and the outer rim of the first curvature area;

h_3 : Difference in height between the inner rim of the second curvature area and the outer rim of the second curvature area;

α_1 : Angle between the y-axis and a line connecting C_2 and C_3 ;

α_2 : Angle between the x-axis and a line connecting C_1 and C_2 ;

f : Parameter related to the portion of the surface covered by the central dimple area in relation to the combined area of central dimple area and curvature areas;

~~wherein a set of parameters, in particular the parameters comprising d_1 , α_1 , α_2 , R_2/R_1 and f , are chosen and the a remaining set of parameters are calculated by means of the following equations with a tolerance of $\pm 10\%$ for each parameter:~~

$$R_1 = \frac{d_1}{2 \cdot \sin \alpha_1},$$

$$R_2 = \frac{R_2}{R_1} \cdot \frac{d_1}{2 \cdot \sin \alpha_1},$$

$$R_3 = \frac{t_1 - \frac{d_1}{2} \cdot \frac{R_2}{R_1} \cdot \frac{(1 - \sin \alpha_1)}{\sin \alpha_2}}{\sin \alpha_2},$$

$$h_1 = \frac{d_1}{2} \cdot \frac{(1 - \cos \alpha_1)}{\sin \alpha_1},$$

$$h_2 = R_2 \cdot (\cos \alpha_2 - \cos \alpha_1),$$

$$h_3 = R_3 \cdot (1 - \cos \alpha_2),$$

$$H = h_1 + h_2 + h_3,$$

$$t_1 = \sqrt{\frac{\pi}{6 \cdot f}} \cdot d_1,$$

$$C_1 = (X_{C1}, Y_{C1}) \text{ with } X_{C1} = 0, \quad Y_{C1} = R_1 - H,$$

$$C_2 = (X_{C2}, Y_{C2}) \text{ with } X_{C2} = \frac{d_1}{2} \cdot \left(1 + \frac{R_2}{R_1}\right), \quad Y_{C2} = R_3 + \frac{X_{C3} - X_{C2}}{\tan \alpha_2},$$

$$C_3 = (X_{C3}, Y_{C3}) \text{ with } X_{C3} = \frac{t_1}{2}, \quad Y_{C3} = -R_3,$$

$$P_1 = (X_{P1}, Y_{P1}) \text{ with } X_{P1} = \frac{d_1}{2}, \quad Y_{P1} = H - h_1,$$

$$P_2 = (X_{P2}, Y_{P2}) \text{ with } X_{P2} = \frac{t_1}{2} - R_3 \cdot \sin \alpha_2, \quad Y_{P2} = R_3 \cdot (\cos \alpha_2 - 1),$$

$$P_3 = (X_{P3}, Y_{P3}) \text{ with } X_{P3} = \frac{t_1}{2}, \quad Y_{P3} = 0,$$

said the equations being defined in a two-dimensional coordinate-system with ~~the~~ an x-axis in the plane of the surface and with ~~the~~ a y-axis through the center of the dimple and perpendicular to the surface.

17. (Currently amended) Surface The surface according to ~~any of the preceding claims~~ claim 12, wherein ~~the~~ said the dimples are arranged periodically on the surface.

18. (Currently amended) Surface The surface according to ~~any of the preceding claims~~ claim 17, wherein the dimples comprises three adjoining dimples each having a center, the centers of three adjoining dimples ~~form a~~ forming a triangle, the distance between two ~~neighboring~~ adjoining dimples of the triangle having a first constant value t_1 -and the distance between two rows of the plurality of dimples having a second constant value t_2 .

19. (Currently amended) Surface The surface according to claim 18, wherein the at least one curvature areas of ~~the~~ said the three adjoining dimples are in contact with each other.

20. (Currently amended) ~~Surface~~ The surface according to claim 18 or 19, wherein further comprising additional dimples of a different size ~~are provided, which are located in~~ in the center of the three respective adjoining dimples.

21. through 24. (Cancelled)

25. (Currently amended) ~~Device~~ A device for transportation of a flowing medium, comprising at least one surface with dimples according to ~~one of claims~~ claim 12 to 24.

26. (Currently amended) ~~Device~~ The device according to claim 25, comprising a transport channel, wherein the at least one surface ~~with dimples~~ is provided as the inner surface of said the transport channel.

27. (Currently amended) ~~Device~~ The device according to claim 26, wherein said the transport channel is a pipe.

28. (Currently amended) ~~Device~~ The device according to ~~one of claims~~ claim 25, to 27, characterized in that comprising at least one surface, wherein the deposition of particles on said the at least one surface is reduced in

comparison to an otherwise identical device with a flat surface.

29. (Currently amended) Device The device according to claim 25 for heat exchange between a the flowing medium and at least one surface of the device, wherein the at least one surface is provided with dimples according to one of claims 12 to 24, in particular provided as a part of an air-conditioning system.

30. (Currently amended) Device The device according to claim 29, characterized in that comprising at least one surface, wherein the forming formation of ice on said the at least one surface is reduced in comparison to an otherwise identical device with a flat surface.

31. (Currently amended) Layer A layer for applying on a surface, wherein said the layer comprises a surface according to claim 1 with dimples according to one of claims 1 to 13.

32. (Currently amended) Layer The layer according to claim 31, having further comprising a first side and a second side, characterized in that said wherein the first side

comprises dimples according to one of claims 12 to 24 and said
the second side is self-adhesive.

33. (Currently amended) Method A method for producing
a surface with having reduced particle deposition and/or
reduced ice formation and/or reduced friction resistance
and/or improved heat exchange with a surrounding medium,
comprising the step of
[[-]] applying athe layer according to claim 31 or 32 onto
said the surface.

34. (Currently amended) A The method according to
claim 33, for producing a surface with having reduced
particle deposition and/or reduced ice formation and/or
reduced friction resistance and/or improved heat exchange
with a surrounding medium, further comprising the steps of
[[-]] providing a workpiece with at least one surface; and
[[-]] imprinting into said the at least one surface a
structure comprising dimples, in particular generating a
surface according to one of claims 12 to 24.

35. (Currently amended) Method The method for producing
a surface according to claim 34 with having reduced particle
deposition and/or reduced ice formation and/or reduced

friction resistance and/or improved heat exchange with a surrounding medium, comprising the steps of

[[-]] providing a casting mold with at least one structured surface; and

[[-]] molding, ~~in particular injection molding,~~ of a workpiece with at least one surface comprising dimples, ~~in particular a surface according to one of claims 12 to 24 by means of said casting mold.~~

36. (Currently amended) Application of The method according to claim 35, further comprising the step of applying a the at least one surface comprising dimples according to one of claims 12 to 24 as a the surface of:

[[-]] a device for transportation of a medium or
[[-]] a device for heat exchange.

37. (Currently amended) Application of The method according to claim 36, further comprising the step of applying a the device according to one of the claims 1 to 11 or 25 to 30 in an air-conditioning system.

38. (Currently amended) Application of The method according to claim 35, further comprising the step of applying a the at least one surface comprising a plurality

ef-dimples as a surface of a flow channel for reducing the deposition of particles, and/or for reducing ice formation when a medium flows along the surface.

39. (Cancelled)

40. (Currently amended) Air-conditioning An air-conditioning system for cooling a heat exchange medium, comprising the at least one flow channel according to claim 38 for the heat exchange medium, wherein ~~the flow channel is in particular provided as a device according to one of the claims 1 to 11 or 25 to 30,~~ the inner surface of said the at least one flow channel ~~being~~ is provided with a plurality of dimples.